

Claims

1. A cooking system based on the principle of heat conduction and comprised of a one-piece cooking surface made of a glass-ceramic material and having at least one cooking zone, which can be individually directly heated by means of heating elements arranged on the underside of the glass- ceramic plate,

characterized in that

the glass-ceramic plate consists of main crystalline phases of the high quartz mixed crystal or keatite mixed crystal type, mainly constituted of the components LiO_2 - Al_2O_3 - SiO_2 , with a coefficient of expansion of $\alpha = 0$ to $1.8 \times 10^{-6}/\text{K}$ and a heat conductivity of $< 3 \text{ W/mK}$, and has at least one cooking zone on the underside,

the heating elements (30) of the cooking zone consist of metallic layers, and

between the underside (11) of the glass-ceramic plate (10) a porous ceramic layer is arranged as the electrical insulating layer (20).

2. The cooking system in accordance with claim 1,

characterized in that

the coefficient of expansion $\alpha = 0$ to $1.5 \times 10^{-6}/\text{K}$.

3. The cooking system in accordance with claims 1 or 2,

characterized in that

the heat conductivity assumes a value $< 2.7 \text{ W/mK}$.

4. The cooking system in accordance with claims 1 or 2,
characterized in that
during a cooking operation at $T = 550^{\circ}\text{C}$, the cooking zone shows arching in
the diagonal direction $< 0.2 \text{ mm}$.
5. The cooking system in accordance with claims 1 to 4,
characterized in that
the heating elements (30) are applied by means of thermal spray methods, in
particular atmospheric plasma spray methods or cold gas spray methods of NiCr base alloys,
NiAl base alloys, CrFeAl base alloys or oxidation-resistant cermets, such as $\text{Cr}_3\text{C}_2\text{-NiCr}$ or
WC-CoCr.
6. The cooking system in accordance with claims 1 to 4,
characterized in that
the heating elements (30) are applied by means of screen printing methods from
Ag/Pd-containing pastes with a glass frit.
7. The cooking system in accordance with one of claims 1 to 6,
characterized in that
the ceramic layer used as an insulating layer (20) consists of Al_2O_3 , mullite,
cordierite, circonium silicate or $\text{SiO}_2/\text{TiO}_2$.

8. cooking system in accordance with one of claims 1 to 7,

characterized in that

the insulating layer (20) is bonded to the underside (12) of the glass-ceramic plate (10) by means of thin strips (21) of primary ceramic particles of a width of approximately 50 to 150 nm.

9. The cooking system in accordance with one of claims 1 to 8,

characterized in that

the heating elements (30) are covered by means of a thermal insulating layer (40) of silicate fiber materials.

10. The cooking system in accordance with one of claims 1 to 9,

characterized in that

the glass-ceramic plate (10) has a specific resistance $> 10^5 \Omega$, and the entire cooking system has a breakdown resistance of $> 3750 \text{ V}$, while in accordance with the standard 60335-1 the leakage current is $< 0.25 \text{ mA}$ per cooking zone.